

Service Manual

the **All Wheel Drive**
REVOLUTION
has **BEGUN**



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Notice:

- Due to the design of the gears, front and rear international standard disk brakes must be reversed on the Christini bikes. The front brake must be mounted on the rear triangle, and the rear brake must be mounted on the front fork.
- To Ensure proper gear alignment, use a sealed cartridge bearing rear hub or be sure the distance between the end of the axle and the disc mount is the universal standard of 15mm (loose ball bearing hubs are often out of spec. due to the floating nature of the axle during assembly).

The entire service manual, as well as technical videos can be downloaded from the following web site:

www.christini.com/resources.php

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Congratulations! You own an All Wheel Drive Bicycle



The CHRISTINI AWD consists of a patented lightweight, internalized, shaft-driven system that allows the rider to engage both wheels for additional power when there is "wheel slip".

With the simple flip of a handlebar-mounted switch, the AWD system provides increased control, traction and stability on slippery or loose surfaces and unmatched power to climb steep hills.

Simply stated, when the rear wheel slips — the front wheel grips.

The Tools You Will Need for Maintenance

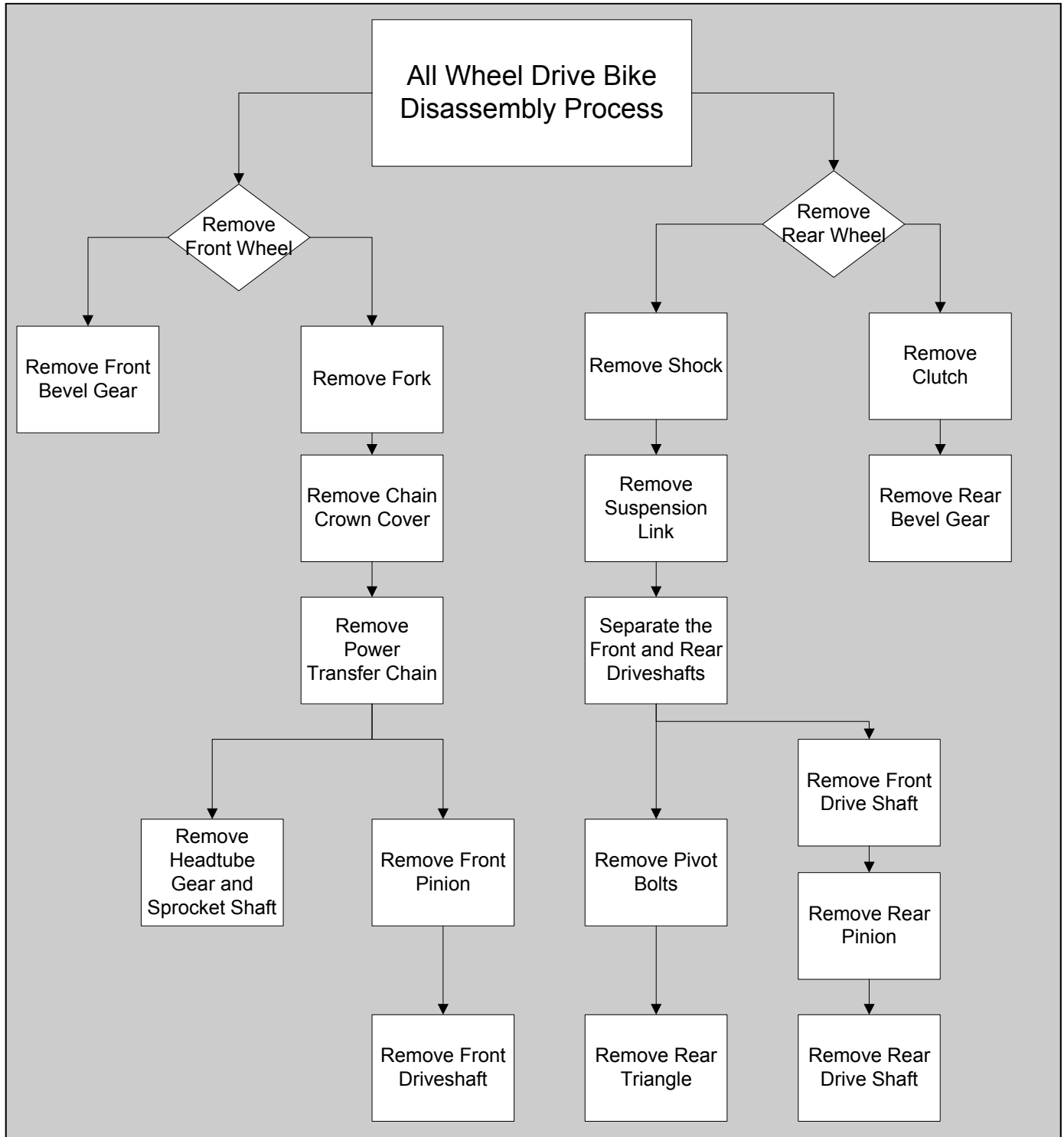


- Allen Wrench Set
 - 2, 2.5, 3, 4 with short end (supplied), 5, 6 millimeter wrenches
- Plastic faced hammer or a rubber mallet
- Large flat bladed screwdriver & small flat bladed screwdriver
- T-25 torx wrench
- 10 millimeter box wrench
- Pair of needle-nose pliers
- Thread Retaining Compound:
 - “Blue” Loc-tite 242 Removable Strength
 - “Red” Loc-tite 262 Permanent Strength

AWD Detail Illustration



Bike Disassembly Flowchart



Custom White Brothers AWD Fork Removal



- Remove the front wheel. The fork legs may need to be pulled apart slightly, since there is a 1 mm indent on the non-disc brake side of the front hub axle. This indent locates the front bevel gear and provides support during heavy AWD loading.
- Remove the front disk brake cable at the lever—or remove the front disk brake caliper.
- Remove the three M6 bolts, located just above the headtube on the front plate, that attach the steering link to the upper steering clamp.
- **Warning—DO NOT** use the rounded Bohndus end of the Allen wrench when first loosening the bolts. You will strip the hex head of these bolts.
- After these three bolts have been removed, the fork can be pushed down out of the headtube of the bicycle. If necessary, use a plastic hammer to tap the fork out. Remove the valve cover on the top of the fork (non-driveshaft side) and tap the top of the crown, being careful not to strike the schrader valve itself.
- Please refer to the White Brother's AWD Fork Owner's Manual to service or adjust the front suspension. (If lost see www.WhiteBros.com for details)

Installation:

- Slide Lower steering tube into the support bearings in the headtube.
- Tap the fork into place with a plastic hammer. Do not tap the crown cover.

Fork Driveshaft Maintenance

Removal

- Remove the four countersunk M4 screws under the crown of fork which hold the crown cover plate in place.
- Remove the Crown-Cover plate. Slide the Upper Front driveshaft and the crown cover plate down, as shown, towards the dropouts. The Upper Front Driveshaft will compress and slide on the splined portion of the drive shaft.



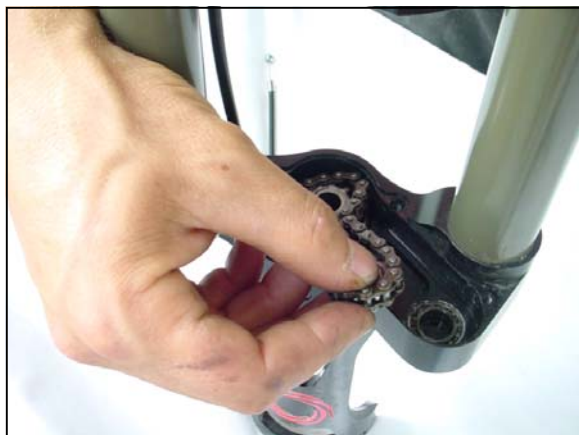
- Remove the fork drive shaft capture bolt. It is an M6 bolt on the end of the fork drive shaft located under the pinion gear.
- To loosen the bolt, use the supplied short-end 4mm Allen wrench to hold the bolt in position while turning the hex piece of the driveshaft counterclockwise (from the top of the fork looking down), with a 10mm box wrench.
- **TIP:** If the driveshaft is stuck in the gear, loosen the bolt halfway and then gently tap the bolt head with a hammer to free the driveshaft.



Fork Driveshaft Maintenance

Removal:

- Slide the two sections of the front drive shaft together.
- The chain crown cover can slide off at this point.
- The pinion gear can also be removed at this point.
- Remove the floating cog and power transfer chain from the internal section of the chain crown.
- Use your thumbs to press the center sprocket up through the lower steering tube.
- Carefully pull the drive shaft out of the steering tube.



Installation:

- Insert the drive shaft into the steering tube, sprocket first, until the miter gear is fully seated on its sealed bearing support.
- Loop the chain around the shaft sprocket and the floating cog. Press the cog into the bearing.
- Press the upper hex portion of the driveshaft into the cog and slide the chain crown up into place.
- Use removable threadlocker when re-installing the crown cover screws.
- Use removable threadlocker on the pinion bolt.



AWD Frame Drive-system Maintenance



Removal:

- Remove the M6 capture bolt from the rear pinion assembly on the rear bevel dropout. Use the supplied short-end Allen Wrench to hold the bolt while spinning the drive system by hand to remove the bolt.
- If necessary, use a 10mm wrench to spin the square spline section of the drive system to help loosen the bolt.
- Remove the rear shock mount bolt, and then slide the shock out from between the Top Yoke, as shown.
- **TIP:** Be careful not to chip the frame paint with the suspension link when the rear triangle swings backward.



Re-assembly:

- Slide the rear pinion into the slot and then drop the rear drive shaft down into the female spline on the pinion.
- Apply removable threadlocker to the M6 bolt and tighten by holding the bolt with a wrench and then spin the drive system clockwise to tighten.
- Install the rear shock mount bolt and the rear shock.



AWD Frame Drive-system Maintenance



Removal:

- Remove the pivot bolt in the lower portion of the suspension link. If necessary, use an Allen wrench smaller than the internal threads to punch the female portion out.
- Carefully lower the rear linkage until the bottom yoke is resting on the bottom bracket pivot casing.
- The main drive-shaft will separate at the square splined universal joint section.
- Remove the plastic dirt cover from the front of the headtube access hole.



- Gently tap the round female slider section with a flat head screwdriver and push the front drive shaft, which is attached to the driving miter gear, out through the access hole in the headtube.

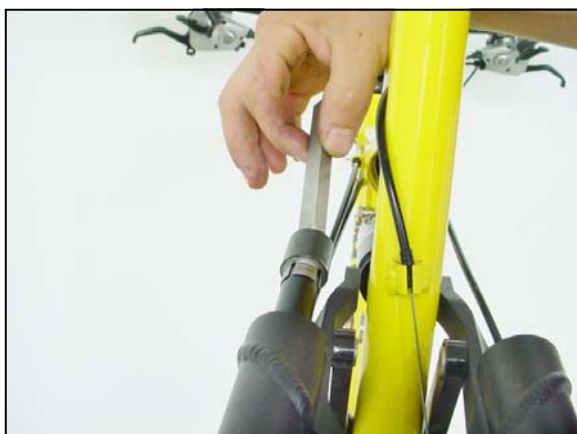


AWD Frame Drive-System Maintenance

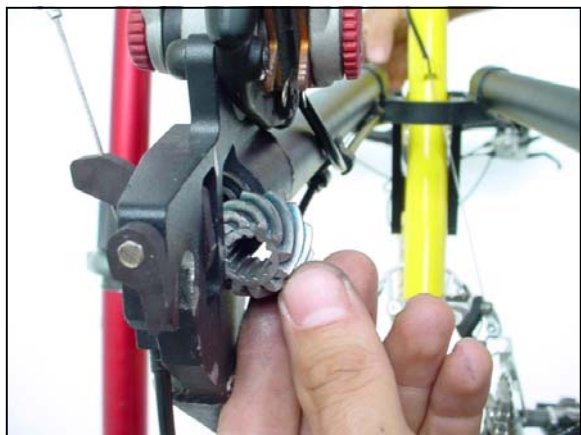


- The entire driveshaft will push through the support bearings located in the headtube.
- To remove the rear driveshaft, pull it forward through the support bearings by gripping the universal joint section.
- The rear drive pinion will slide out from the dropout slot.

Installation:



- Slide the rear and front drive-shafts into their respective frame tubes. The front shaft will slide through the headtube support bearings and then firmly seat on the edge of the miter gear. The rear shaft will slide through the support bearings but may not seat completely on the u-joint section. There may be a small gap between the u-joint and the bearing in the top yoke.
- If necessary, replace the rubber u-joint boots (only applies to some models).
- Slide the square spline section into the round female section before you begin to re-attach the suspension link and the shock.



AWD Clutch Maintenance

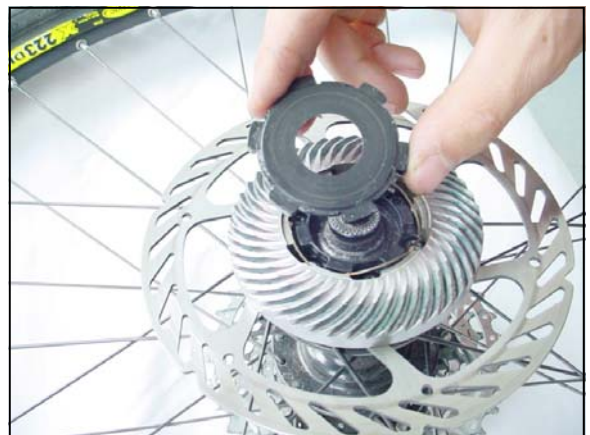
Removal:

- Remove the rear wheel and quick release skewer.
- Push down of the top clutch plate and rotate the bevel gear until the clutch plate does not spring back up.
- Remove the clutch snap ring from the groove in the top of the rear bevel gear.
- Slide the top “sliding jaw” of the clutch up and out of the guides in the gear assembly.



Installation:

- Attach the clutch and gear assembly to the rear wheel (see page 14).
- Make sure that the engagement cams are in the off position, they should be flush with the surface of the dropout.
- Re-install the rear wheel, making sure to seat the axle completely into the rear dropouts.
- Test the engagement and disengagement of the clutch.



AWD Clutch Maintenance



Removal:

- Remove the circular wave spring.
- Use a Torx wrench to remove the 6 disk brake bolts that attach the gear assembly to the disk brake hub.
- Remove the gear assembly from the hub.
- To remove the “locked jaw” turn over the gear assembly, and remove the 4 M3 countersunk bolts that attach the large diameter clutch bearing to the gear.
- Press or tap out the locked jaw section from the bearing.



Re-assembly:

- Press the clutch bearing and locked jaw into the gear.
- Install the circular wave spring into the locked jaw section making sure that the broken “tabs” are facing away from the hub are lined up with a sliding jaw guide slot (top left picture).
- Install the sliding clutch plate by lining up the 6 guides into the appropriate slots, then press down on the plate 4-5mm and slightly rotate the plate until it does not spring back up.
- Install the snap ring and make sure that the clutch is free to rotate when the sliding jaw is pressed in completely.



Front Hub Maintenance



Removal:

- Loosen the set screws on the end caps and remove them from the axle.
- With a plastic hammer, tap the disc side axle to loosen the freewheel insert. A punch may be needed to completely free the insert from the hubshell.
- Remove the freewheel insert and axle from the hub.
- Apply a light oil or grease to the roller bearings inside the hubshell.



Note: It is not necessary to remove the bevel gear or the brake rotor to service the freewheel.



Re-assembly:

- Press the axle and freewheel insert back into the hub shell until the insert is flush with the hubshell bearing. A plastic hammer may be needed to tap the insert back into place.
- Insert the end caps onto the axle and tighten the set screws.
- Note: The flat face of the gear side end cap should face outward.



AWD Engagement Switch Detail



Figure 1

- Install the switch on the left side of the handlebars between the shifter and the brake lever.
- Use a 2mm Allen wrench to tighten the clamp bolt which secures the switch to the handlebars.
- The drivesystem is engaged when it is in the position shown in figure 1.
- To disengage the system, push the lever forward as far as it will go. To engage the system again push on the engagement button (figures 2 and 3).



Figure 2



Figure 3



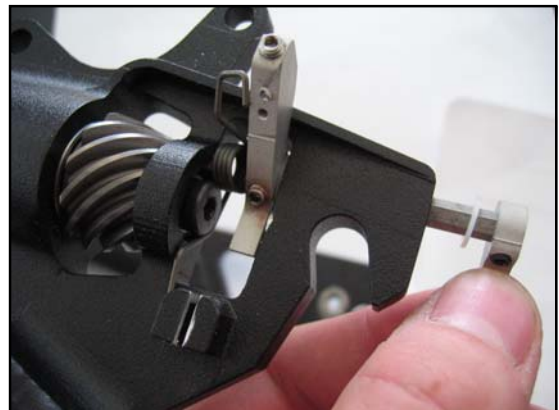
AWD Engagement Cams

Cable Adjustment:

- To attach the cable from the switch to the engagement cams, loosen the set screw located in the top of the long cam and slide the cable through.
- Install the rear wheel and clutch assembly in the dropouts.
- To adjust the cams, make sure the switch is in the engaged positions, pull the cable taut and tighten the set screw.
- Once the slack is taken out of the cable, no further adjustment is needed.

Cam Removal:

- To remove the cam system from the dropouts, loosen the hex set screw on the long cam.
- Slide the short cam and hex shaft out from the dropout.



Rear Triangle Detail



- Disassemble the shock by removing the upper shock bolt using a 5mm Allen wrench and an 10mm box wrench.
- Remove the large bolts where the rear triangle and the front triangle connect at the suspension pivot.
- Remove the M8 bolts from the remaining connection between the suspension link and the rear triangle.



- There is a washer on either side of the suspension link that needs to be installed between the link and the rear triangle. This washer fits through the threaded section of upper suspension link bolts.
- During re-assembly—use removable threadlocker on all pivot bolts.



AWD Bearing Maintenance



- All bearings should rotate smoothly.
- Bearings should be replaced if they begin to make excessive noise or they feel “notchy”.
- Bearings are sealed and do not require lubrication.
- Please contact Christini if you think a bearing needs to be replaced.

Routine Maintenance Schedule



AVOID:

- Water in the headtube.
- Water inside the frame.
- Mud, dirt, or sand in the u-joints or gear sets for extended periods.

As Needed

- Wash exposed drive system parts with soap and water or a bike cleaner.
- Replace bearings if excessive noise or friction develops.
- Lubricate all spline shafts if suspension performance is effected.
- Replace worn or damaged mud guards.

Monthly

- Tighten frame linkage bolts.
- Check disk brake bolts.
- Lubricate headtube gearset with grease.
- Lubricate the front and rear bevel gears with chain lube.

Yearly

- Disassemble, clean and inspect the rear bevel clutch assembly.
- Apply lightweight oil lube to the front "silent freewheel" hub.

General Notes:

- During re-assembly of the frame and fork apply grease to all bolts that aren't specified to be assembled with Loc-tite threadlocker.
- The Christini AWD bike comes with several devices to provide dirt and mud protection. Replace any of these protective devices if they show signs of extreme wear:
 - U-joints—shrink-wrap boot (only applies to some models)
 - Square spline section—round to square scraper
 - Headtube—protective plastic cap over miter gear access hole
- For all questions regarding tuning or maintenance of the White Brother's Fork please see the separate White Brother's owner's manual.
- For all questions regarding tuning or maintenance of the Rear Shock please see the separate Rear Shock owner's manual.

AWD Lubrication Guide

Spline Shafts

Apply chain lube regularly.

During operation in muddy conditions, clean and lube the front fork spline and the rear shock spline as often as possible.

Spiral Bevel Gears

Gears are coated with TEFNI2000 to provide lubrication and corrosion resistance.

Apply a light amount of Pro-Gold chain lube if noise occurs.

Front “Silent” Freewheel Hub

Apply a lightweight oil lube if the hub friction increases or if it begins to squeak.

AWD Troubleshooting

Problem

Clutch plate squeaks when the rear wheel is rotating.

Solution

Apply a chain lubricant such as Pro-Gold to the face of the clutch plate.



Clutch plate makes a clicking noise as the rear wheel rotates.

AWD engagement switch lever needs to be pushed farther forward (see page 16).

Front Freewheel Hub squeaks

Slack needs to be taken out of the switch cable (see page 17)

Apply a light oil or grease to the roller bearings inside the hubshell (see page 15).

CHRISTINI Technologies / CHRISTINI AWD Limited Warranty

This LIMITED WARRANTY is a complete and exclusive statement of CHRISTINI's obligations to the ORIGINAL OWNER of a CHRISTINI bicycle product.

CHRISTINI FRAMESET LIMITED WARRANTY

CHRISTINI Technologies warrants:

1. All **aluminum suspension and rigid frames** to be free from defects in material and workmanship **for a period of five (5) years** from the date of purchase for the Original Owner.
2. All other original **CHRISTINI AWD components**, including the fork machined parts (*excludes suspension fork slider tubes and internal suspension mechanisms, see below*), the front wheel free-hub, and the components of the CHRISTINI All Wheel Drive (AWD) system including clutch, shafts, and drive gears are warranted to be free of defects in material and workmanship **for a period of two (2) years** from the date of Purchase for the Original Owner.
3. All CHRISTINI AWD system bearings and any CHRISTINI AWD brand replacement parts are warranted to be free of defects in material and workmanship **for a period of one (1) year** from the date of Purchase for the Original Owner.

FINISH

Any finish applied by CHRISTINI (paint, decals, etc.) are warranted against any manufacturing defect for a period of **one (1) year** from the date of purchase. Scratches, dings, abrasions caused during riding, transport, or handling of the product are not considered defects.

OTHER ORIGINAL COMPONENTS

Any components not produced by CHRISTINI, including the front suspension fork internal mechanisms, bear their original manufacturer's own warranty and CHRISTINI reserves the right to direct any warranty request relating to those Other Original Components to said manufacturer's customer service department.

LIMITED REMEDY

Unless otherwise provided, the sole remedy under the above warranty or any implied warranty is limited to the replacement of defective parts with those of equal or greater value at the sole discretion of CHRISTINI. No cash refunds will be offered under this warranty and you will be responsible for labor costs associated with warranty replacements. **IN NO EVENT WILL CHRISTINI AWD BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT PRODUCTS LIABILITY, INCLUDING, WITHOUT LIMITATION, PERSONAL INJURY DAMAGES, PROPERTY DAMAGE, OR ECONOMIC LOSSES.**

Note: In those states that do not allow the exclusion or limitation of incidental or consequential damages, the above limitation or exclusion may not apply to you.

EXCLUSIONS

The above warranty, or any implied warranty, does not cover normal WEAR AND TEAR, and all warranties are void if the bicycle is used for other than normal activities, including, but not limited to, the failure to follow the directions for assembly, the instructions, warnings and advice found in

the owner's manual or using the bicycle for commercial activities or in competitive events, including bicycle racing, bicycle motocross racing, stunt riding, ramp jumping or similar activities and training for such activities, or events. This warranty does not cover any damage, failure, or loss caused by accident, misuse, abuse, neglect, improper assembly, improper maintenance, or use of parts or devices not consistent with the original intent for the product sold.

CHRISTINI TECHNOLOGIES MAKES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED, IN DURATION TO THAT OF THE EXPRESS WARRANTIES STATED ABOVE. Some states do not allow limitations on how long an implied warranty lasts so the above limitation may not apply to you. The warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

WHAT YOU SHOULD DO

- 1) Always wear a helmet while riding. Please remember to always ride safely and in control and within your capabilities and limitations. Even under normal riding, bicycles and mountain bikes can be dangerous due to changing and variable riding conditions including known and unknown hazards.
- 2) This Warranty is void if your bicycle is subjected to abuse or abnormal use.
- 3) This Warranty applies only to the Original Owner (first retail purchaser from bicycle dealer, distributor, or direct from Christini) so we suggest you register your purchase with CHRISTINI at the time of purchase. Because Proof of Purchase by the Original Owner is required for making any Warranty Claim, taking this simple step will save you time looking for the receipt later. Please fill out and return the Warranty Registration section below.
- 4) Bring your bicycle along with your purchase receipt or other proof of the date of purchase to the store where you purchased the bicycle or write to the Warranty Service Department at:
CHRISTINI AWD
421 N. 7th Street, Suite 200
Philadelphia, PA 19123
Phone: (215) 351 9895
- 5) Freight costs and any labor charges for part change overs, assembly, repair, or disassembly are the responsibility of the Original Owner and **this Warranty offers no cash refunds.**

CHRISTINI PURCHASE REGISTRATION FORM

Original Owner Name: _____
Address: _____

Date Purchased: _____
Purchase Price: _____

Store Where Purchased: _____ City / State: _____

Product Model: _____ Bottom Bracket Serial Number: _____

- ☐ Would you like to receive CHRISTINI AWD product information and updates?
- ☐ Would you be willing to participate in the CHRISTINI AWD one-year and two year surveys?

Please detach and save a copy of this Registration Form and return original to: Christini Purchase Registration, Christini Technologies, 421 North 7th Street, Suite 200, Philadelphia PA 19123